



Outcome of Conservative Treatment for Massive Lumbar Disc Herniation

Mostafa F. Tantawy

Neurosurgery Department, Faculty of Medicine, Beni-Suef University, Egypt.

Abstract

Background: There is ongoing discussion over the ideal surgical procedures for big, extruded discs. A substantial sequestered disc has historically been considered a relative indication for surgery. Number of studies have shown that these discs have the highest propensity to get smaller in response to conservative therapy. **Methods:** A check of our institution's database from January 2019 to January 2020 revealed 20 patients who received conservative care for painful radiculopathy caused by a herniated lumbar disc. They visited a spine clinic throughout a two-year period. A "massive" herniation was characterised as when the spinal canal on axial MRI scans was at least 50% obstructed by disc material. Pain relief and radiological improvement were assessed at diagnosis and at follow up. Pain relief was assessed by VAS. **Results:** With a mean age of 46.30, there were eight men and twelve women. At the L5-S1 level, there were seven herniations, and there were thirteen at the L4-5 level. The disc's mean canal occupancy percentage varied from 50% to 70% on an axial MR scan. These scans were performed (on average) 11 to 27 months after the initial scan. On According to an MRI, the herniation's size was decreased by an average of 80.2% (from 65% to 100%). Three patients needed discectomies because of persistent discomfort, despite the disc herniation appearing to have healed radiologically on MRI. Cauda equina syndrome was unheard of. The mean VAS was 7.75 during diagnosis and 3.50 after follow-up. There was a statistically significant difference between the VAS at diagnosis and the VAS at follow-up since the P value was more than 0.05. **Conclusion:** When lumbar disc herniation producing radiculopathy was treated conservatively, the clinical condition of the patients significantly improved. Conservative treatment was considered effective and safe in the management of massive lumbar disc herniations.

5174

KeyWords: lumbar; VAS; massive; herniation; radiculopathy.

DOI Number: 10.48047/nq.2022.20.5.NQ22794

NeuroQuantology 2022; 20(5): 5174-5177

Introduction:

Each year, 0.1% to 0.5% of adults experience sciatica as a result of lumbar disc herniation (LDH) [1]. Sequestered disc, often referred to as a free fragment, is the most severe type of LDH. The free portion is no longer joined to the intervertebral disc [2]. Many studies [3, 4] have indicated that, although while surgical option is frequently acknowledged as being useful for the management of LDH, the majority of LDH patients could improve with conservative management. Understanding the natural history of any disease is essential to making decisions regarding this condition. There are no strong justifications in the literature for surgical intervention, and the natural history of LDH is not thoroughly understood. Yet, as technology advances and the number of orthopaedic and neurosurgeons in the region rises, back procedures are becoming more common [5].

There is ongoing discussion over the ideal surgical procedures for big, extruded discs. Significantly

sequestered discs have always considered a relative indication for surgery [6]. Nonetheless, a number of studies have shown that these discs are most likely to shrink in size in response to conservative therapy [7, 8]. Weber [9] presented the results of the first prospective randomised trial contrasting surgical treatment for LDH with non-surgical treatment. He showed that after a year, the operative treatment had a statistically significant result. After 4 years, the outcomes for the operated cases remained better, although the difference was not statistically significant. This study intends to illustrate our understanding of conservative treatment for herniated lumbar discs. Results and issues would be reported.

Patients and Methods:

The database of our institution's research Centre revealed 20 patients who had conservative care for painful radiculopathy caused by lumbar disc herniation between January 2019 and January 2020. They visited a spine clinic throughout a two-year



period. Whether they feared surgical complications, or their symptoms had begun to improve on their own, or both, the patients selected conservative treatments. Axial MRI images showed at least 50% disc material occluding the spinal canal, which was the definition of a "massive" herniation. Estimates were made of the disc's and the spinal canal's anteroposterior diameters; a proportion of the former is provided for the latter. Patients were specifically instructed to return for urgent surgery if they showed signs of cauda equine syndrome. If not, they were instructed to come back for a clinical evaluation and an additional MR scan. The following traits were used to distinguish between protrusion and extrusion. The disc herniation was categorised as a protrusion if the largest distance, in any plane, between the margins of the disc material beyond the disc space was smaller than the distance between the borders of the base in the same plane. A disc extrusion was deemed to exist if any individual distance between the edges of the disc material outside the disc region was higher than the distance between the edges of the base measured in the same plane. After an extrusion, the displaced disc material was referred to as sequestration if it had completely severed from the parent disc. There were no conflicts of interest, and all study procedures were carried out in strict accordance with accepted ethical standards. There is absolutely no financial disclosure.

Outcome Measures:

The main results were an improvement in radiological conditions and pain alleviation. VAS was used to measure pain alleviation. Leg discomfort was evaluated as a result. The size of the herniated disc was reduced to measure radiological progress. If patients improved their VAS, they were deemed a categorical success.

Results:

Eight of the 20 disc herniations were sequestrations, making up the total of 20 herniations. As there was no annulus to enclose them, all were uncontained. There were eight men and twelve women, with a mean age of 46.30. Seven herniations occurred at the L5-S1 level and thirteen at the L4-5 level. On an axial MR scan, the disc's mean canal occupancy percentage ranged from 50% to 70% [Figure 1]. After the initial scan, these scans were conducted on average 21.95 months later (ranging from 11 to 27). By the time of the second MR scan, all herniations but one had significantly improved [Figure 2]. The reduction in size of the

herniation on MRI was a mean of 80.2% (65% to 100%). Three patients needed a discectomy because of persistent pain despite radiological resolution of the disc herniation on MRI. No patient developed a cauda equina syndrome. The mean VAS at diagnosis was 7.75 and the mean VAS at follow up was 3.50. There was statistically significant difference between the VAS at diagnosis and the VAS at follow up as the P value was < 0.05

Statistical Methods:

Statistics used to explain the data were mean, standard deviation (SD), and range. Wilcoxon signed rank test for paired (matched) samples was used to compare VAS at diagnosis and VAS at follow up. When the two-sided p value was less than 0.05, it was judged statistically significant. Microsoft Windows and IBM SPSS (Statistical Software for the Social Science; IBM Corp., Armonk, NY, USA) release 22 were used for the statistical analysis.

Table [1]: Patient characteristics

	N	Minimum	Maximum	Mean	SD
Age	20	27	61	46.30	8.399
Space occupied %	20	50	70	58.75	6.859
Mean follow up scan	20	11	27	21.95	4.359
Reduction in size	20	65	100	80.20	10.350
VAS at diagnosis	20	6	10	7.75	1.020
VAS at follow up	20	1	9	3.50	2.544

Values are expressed as mean ± SD, N: Number, SD: Standard deviation

Figure [1]: MRI lumbosacral spine axial view T2 weighted image showing L 4-5 disc herniation

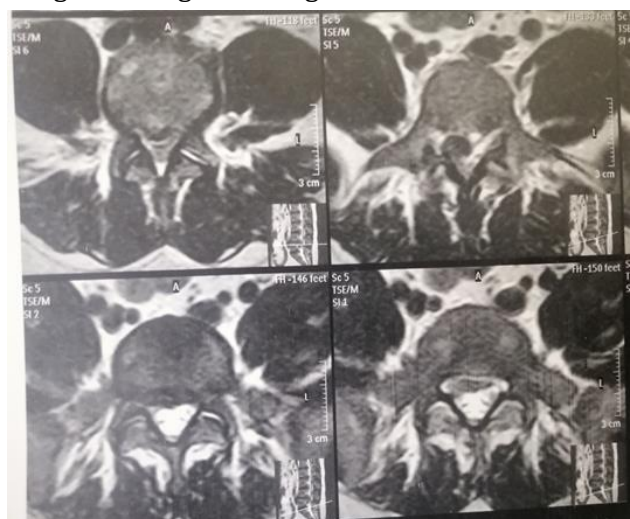
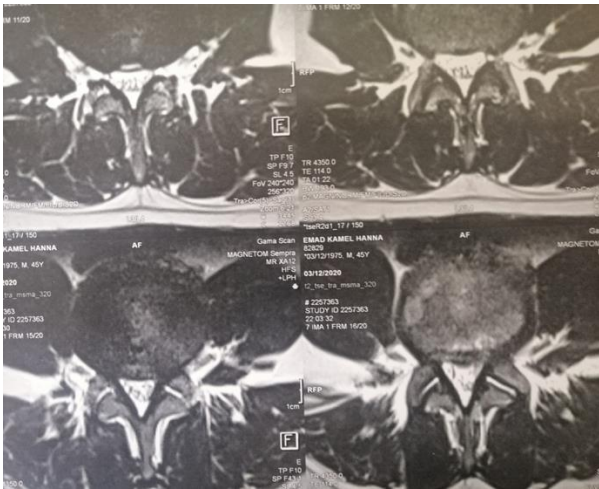


Figure [2]: MRI lumbosacral spine axial view T2 weighted image showing radiological resolution of L 4-5 disc herniation



Discussion:

LDH is a widespread condition that impairs patients' capacity to function, leading to impairment and a lower quality of life. Several investigations have demonstrated that a phagocytic process involving macrophages is responsible for the reabsorption of LDH. The outer layer of the herniated disc material experiences angiogenesis and an inflammatory response as a result [10, 11]. Moreover, the nucleus pulposus' proteoglycan breakdown results in the herniated disc fragment's dehydration, which reduces the disc's volume [12, 13]. Disc resorption may potentially be impacted by apoptosis [14, 15]. In a study by Bush et al. [16], 165 patients with sciatica who were given the diagnosis of lumbosacral nerve root affection participated. Repeated epidurals served as the primary form of therapy. 14% of patients had surgery, and the remaining patients had satisfactory clinical improvement, according to the findings. Unexpectedly, 64 of the 84 ruptured intervertebral discs had entirely or partially recovered after a year, according to the follow-up CT scan. Yet, after a year, only 7 of the 27 bulging discs showed any signs of resolution. This was discovered, and it was statistically significant. The largest lumbar disc herniations had the greatest tendency to get smaller over time, according to several investigations employing CT and MRI [16]. In a study, Shan et al. looked at the progression of lumbar disc herniation in patients who had modic alterations and those who did not (MC). The Oswestry Disability Index scores dropped from an average

of 29.4 to 23.5 in the non-MC group ($P = 0.05$) after receiving conservative treatment, whereas the drops in the MC group (30.1-29.0) were not statistically significant. Following conservative therapy, herniated volumes decreased in the non-MC group (0.44-0.21 cm³, $P 0.05$), but not in the MC group (0.52-0.45 cm³, $P > 0.05$). Compared to the MC group, neovascularization and macrophage invasion were more common in the herniated tissue from the non-MC group ($P 0.001$) [16]. To reduce the incidence of cauda equina syndrome, some surgeons favour early surgical surgery for severe lumbar disc herniation. This worry might be inflated. Complications were avoided by using conservative treatment techniques on large sequestered fragments. The surgical procedure to treat lumbar disc herniation is also not simple. Recurrence rates after surgical intervention are 7.9% [17], necessitating more challenging surgery through extensive adhesions surrounding the afflicted nerve root. Moreover, surgery had a 3.5% rate of cerebrospinal fluid leak following original discectomies and a 13.2% incidence following revision surgery. About 3% of people had infections [19]. The literature had described cases of death, severe damage to great vessels, or visceral perforation [20].

There are some potential flaws in our study. There has been no validation of the software used to analyse the disc volume. However, one radiologist used the same methodology for the entire study. Since it was uncertain how quickly the discs were being reabsorbed, we did not perform set follow-up scan intervals. The initial follow-up scan was not carried out before six months. We performed various different time intervals to investigate the natural history of a herniated lumbar disc over a two-year period. Patients with sciatica should be advised to wait and initially consider conservative therapy alternatives. It is possible to let large disc herniations naturally resorb on their own. Early surgical referral and early diagnostic imaging may lead to unnecessary surgical treatment.

Conclusions:

When lumbar disc herniation producing radiculopathy was treated conservatively, the clinical condition of the patients significantly improved. Massive lumbar disc herniations were treated using conservative measures, which were deemed effective and secure. We contend that the threat posed by this condition may not be as great as previously believed.



REFERENCES

1. **Kelsey JL, WHITE III AA.** Epidemiology and impact of low-back pain. *Spine* 1980 Mar 1;5(2):133-42.
2. **Albert HB, Manniche C.** The efficacy of systematic active conservative treatment for patients with severe sciatica: a single-blind, randomized, clinical, controlled trial. *Spine (Phila Pa 1976)* 37:531-542, 2012
3. **Bozzao A, Gallucci M, Masciocchi C, Aprile I, Barile A, Passariello R.** Lumbar disk herniation: MR imaging assessment of natural history in patients treated without surgery. *Radiology*1992Oct;185(1):135-41
4. **Bush K, Cowan N, Katz DE, Gishen P.** The natural history of sciatica associated with disc pathology. A prospective study with clinical and independent radiologic follow up. *Spine* 1992;17:1205-12
5. **Cherkin DC, Deyo RA, Loeser JD, Bush T, Waddell G.** An international comparison of back surgery rates. *Spine* 1994;19:1201-6
6. **Postacchini F.** Results of surgery compared with conservative management for lumbar disc herniations. *Spine* 1996;21:1383-7.
7. **Ahn SH, Ahn MW, Byun WM.** Effect of the transligamentous extension of lumbar disc herniations on their regression and the clinical outcome of sciatica. *Spine*. 2000;25:475-80.
8. **Cribb GL, Jaffray DC, Cassar-Pullicino VN.** Observations on the natural history of massive lumbar disc herniation. *J Bone Joint Surg Br.* 2007;89:782-4
9. **Weber H.** Lumbar disc herniation. A controlled, prospective study with ten years of observation. *Spine*. 1983;8:131-40.
10. **Arai Y, Yasuma T, Shitoto K, Yamauchi Y, Suzuki F.** Immunohistological study of intervertebral disc herniation of lumbar spine. *Journal of orthopaedic science.* 2000 May 1;5(3):229-31.
11. **Haro H, Kato T, Komori H, Osada M, Shinomiya K.** Vascular endothelial growth factor (VEGF)-induced angiogenesis in herniated disc resorption. *Journal of Orthopaedic Research.* 2002May1;20(3):409-15.
12. **Autio RA, Karppinen J, Niinimäki J, Ojala R, Kurunlahti M, Haapea M, Vanharanta H, Tervonen O.** Determinants of spontaneous resorption of intervertebral disc herniations. *Spine* 2006 May 15;31(11):1247-52.
13. **Henmi T, Sairyo K, Nakano S, Kanematsu Y, Kajikawa T, Katoh S, Goel VK.** Natural history of extruded lumbar intervertebral disc herniation. *Journal of Medical Investigation* 2002 Feb;49(1/2):40-3.
14. **Ha KY, Kim BG, Kim KW, Oh IS, Seo JY.** Apoptosis in the sequestered nucleus pulposus compared to the remaining nucleus pulposus in the same patient. *Spine* 2011 Apr 20;36(9):683-9.
15. **Ha KY, Koh IJ, Kirpalani PA, Kim YY, Cho YK, Khang GS, Han CW.** The expression of hypoxia inducible factor-1 α and apoptosis in herniated discs. *Spine* 2006 May 20;31(12):1309-13.
16. **Shan Z, Fan S, Xie Q, Suyou L, Liu J, Wang C, Zhao F.** Spontaneous resorption of lumbar disc herniation is less likely when modic changes are present. *Spine*. 2014 Apr 20;39(9):736-44.
17. **Morgan-Hough CV, Jones PW, Eisenstein SM.** Primary and revision lumbar discectomy: a 16-year review from one centre. *J Bone Joint Surg [Br]* 2003;83-B:871-4.
18. **Tafazal SI, Sell PJ.** Incidental durotomy in lumbar spine surgery: incidence and management. *Eur Spine J* 2005;14:287-90.
19. **Rohde V, Meyer B, Schaller C, Hassler WE.** Spondylodiscitis after lumbar discectomy: incidence and a proposal for prophylaxis. *Spine* 1998;23:615-20.
20. **Goodkin R, Laska LL.** Vascular and visceral injuries associated with lumbar disc surgery: medicolegal implications. *Surg Neurol* 1998;49:358-72.

